

REMARKS

Applicants hereby affirm the election of claim 1 made in response to the prior restriction requirement. Claim 1 is prosecuted and claims 2-10 have been canceled with the right reserved to file a divisional application thereon.

A Request for Approval of Drawing Changes to identify Figures 29-33 as "prior art" is attached and the specification has been amended to reflect the same.

Applicants have made minor corrections to the specification, and have amended claim 1, to clarify the same.

Applicants' invention is an alternator which has a rotor for forming north-seeking (N) and south-seeking (S) poles alternately about a rotational circumference, and a stator having a stator core surrounding the rotor and a polyphase stator winding installed in the stator core. The stator core is formed with a number of slots extending axially at a predetermined pitch in a circumferential direction and is provided with an abutting portion extending axially. The abutting portion allows the stator core to be formed into an annular shape by abutting end portions of the stator core. The polyphase stator winding has a number of winding portions in which a pair of long strands of wire are wound such that each of the pair intercrosses each other to alternately occupy an inner layer and an outer layer in a slot depth direction within the slots at intervals of a predetermined number of slots. The strands of wire fold back outside the slots at axial end surfaces of the stator core. An insulating member is interposed between the stator core and the winding.

Reconsideration and removal of the rejection of claim 1 under 35 U.S.C. § 103(a) as obvious based on a combination of Kusase (U.S. Patent No. 6,147,432), Adachi (JP'052) and Ringland (U.S. Patent No. 2,821,641), are respectfully requested on the basis of the present amendment to the claims and the following remarks.

Kusae is directed to an alternator for a vehicle. As shown in Figs. 1-4, a stator winding has a plurality of conductor segments 33 and insulators 34 disposed between the conductor segments 33, where the conductor segment 33 is a U-shaped member that has a turn portion 33c and conductor portions 33a, 33b disposed in a slot on the periphery of a stator core 32. As admitted in the Office Action, however, there is no suggestion of the following two features:

- (a) the stator core being provided with an abutting portion extending axially for forming the stator core into an annular shape;
- (b) winding portions wound and arranged alternately in an inner layer and outer layer within the stator slots.

Adachi and Ringland are relied upon in the Office Action to supplement the deficiencies in Kusae in failing to illustrate the above features.

The Adachi reference merely discloses an alternator having a stator core 51 with a welding portion 51b.

The further reference to Ringland discloses a transposed stranded conductor for windings of dynamoelectric machines. As illustrated in Fig. 1, the conductor strands are transposed

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uniformly by rotation to occupy all slot positions. For example, at column 2, lines 154-161, Ringland describes this as follows:



In distributing the conductor along the core slot length, the conductor strands are transposed uniformly by rotation to occupy all slot positions. This transposition is illustrated in Fig. 1 for a clockwise rotation of strands *a* through *j* in that conductor *a* follows conductor *b* from the top to the bottom of the core slot, and continues around to the top again. Rotation of the strands may, of course, be either clockwise or counterclockwise.

(emphasis added)

In contrast with the invention of claim 1, as now amended, there is no teaching nor suggestion in Ringland or Adachi, taken singly or together, of "a number of winding portions in which a pair of long strands of wire are wound such that each of the pair intercrosses each other to alternately occupy an inner layer and an outer layer in a slot depth direction within said slots at intervals of a predetermined number of slots." Specifically, the uniform strand transposition by rotation to occupy all slot positions in Ringland is completely distinct from alternate strand transposition of the present invention. Claim 1, as now amended, clearly identifies this feature. This feature is clearly described on page 7, line 35 to page 31, line 17, of the present specification and in the drawings of Figure 3. Accordingly, it is respectfully requested that claim 1 is not obvious over the combination of Kusae, Ringland and Adachi.

In view of the foregoing, the claims are now believed to be in form for allowance, and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned at the telephone number listed below.

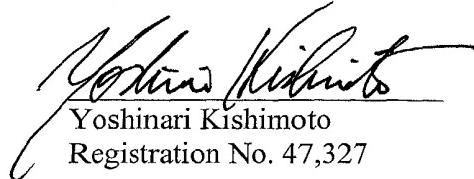
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Attached hereto is a copy of version with markings to show changes made.

Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE DRAWINGS:

Attached hereto is a Request for Approval of Proposed Drawing Corrections. Attached with the Request is a copy of Figs. 29-33 with the changes indicated in red ink.

IN THE SPECIFICATION:

The specification is changed as follows:

Page 6, paragraph 11:

Figure 1 is a cross section showing the construction of an automotive alternator according to Embodiment 1 of the present invention, Figure 2 is a perspective of the stator of this automotive alternator, Figure 3 is an end elevation explaining connections in one phase of stator winding ~~group~~ group in this automotive alternator, Figure 4 is a circuit diagram for this automotive alternator, and Figure 5 is a partial cross section of the stator core in Figure 1. Moreover, lead wires and bridging wires have been omitted from Figure 2.

Page 8, paragraph 3, which bridges over to page 9:

In addition, a portion of the strand of wire 30 of the second winding sub-portion 32 extending outwards at the first end of the stator core 15 from slot numbers 61 and 67 is cut, and a portion of the strand of wire 30 of the first winding sub-portion 31 extending outwards at the first end of the stator core 15 from slot numbers 67 and 73 is also cut. A first cut end 31c of the first winding sub-portion 31 and a first cut end 32c of the second winding sub-portion 32 are

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joined to form one phase of stator winding group 161 having four turns connecting the first to fourth winding sub-portions 31 to 34 in series.

Page 16, paragraph 1:

Figures 28 (a) and (b) show Embodiment 7 of the present invention. In Embodiment 7, end portions of the teeth 51 defining the slots 36a of the base core 36 are pressed and plastically deformed after integration of the base core 36 and the wire-strand groups 35A and 35B, thereby dividing the base insulating members 72 and forming the insulating members 19 as the width dimensions of the opening portions 36bb of the slots 36 are being reduced. Thus a separate step of dividing the base insulating members 72 can be omitted.

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) An alternator comprising:
 - a rotor for forming north-seeking (N) and south-seeking (S) poles alternately about a rotational circumference; and
 - a stator comprising:
 - a stator core surrounding said rotor; and
 - a polyphase stator winding installed in said stator core,
 - said stator core being formed with a number of slots extending axially at a predetermined pitch in a circumferential direction and being provided with an abutting portion extending axially, said abutting portion making said stator core into an annular shape by abutting end portions of said stator core,

said polyphase stator winding comprising a number of winding portions in which a pair of long strands of wire are wound so as to such that each of the pair intercrosses each other to alternately occupy an inner layer and an outer layer in a slot depth direction within said slots at intervals of a predetermined number of slots, said strands of wire folding back outside said slots at axial end surfaces of said stator core, and

an insulating member being interposed between said stator core and said winding.